

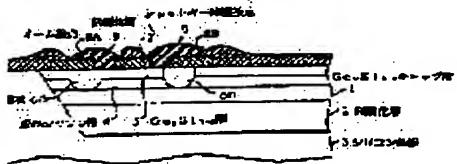
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(71) Applicant : **AMERICAN TELEPH &  
TELEGR CO <ATT>**  
(72) Inventor : **BRASEN DANIEL  
FITZGERALD JR EUGENE A  
GREEN MARTIN L  
XIE YA-HONG**

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**(54) SEMICONDUCTOR DEVICE AND PRODUCING METHOD THEREFOR**



(57) Abstract:

PURPOSE: To grow a large area hetero body structure of hierarchized GexSi<sub>1-x</sub> alloy having a low-level threading transfer defect on silicon by growing germanium-silicon alloy at a high temperature and increasing the germanium component with a gradient more than a specified value.

CONSTITUTION: A silicon substrate 3 is prepared. The substrate is a sort of standard (100) direction silicon wafer generally used for producing an integrated circuit. A large area hierarchized layer 2 of germanium-silicon alloy GexSi<sub>1-x</sub> is grown on the silicon substrate 3 at a high temperature. A growing process is chemical vapor deposition(CVD) or molecular beam epitaxy(MBE). A substrate growth starting temperature is in a range of 850 to 1100°C. Thus, the area of hierarchized alloy exceeds 1200 micrometer 2. The start composition is preferably pure silicon. The germanium forms GexSi<sub>1-x</sub> with the gradient less than about 25%/micron.

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